

REMARKS/ARGUMENTS

In response to the Office Action mailed August 11, 2008, Applicant amends his application and requests reconsideration. No claims are added and claims 2 and 21 are cancelled. Claims 1, 3-20, and 22-28 are now pending in this patent application. Pursuant to a species election requirement and an election, only claims 1, 2, 8-10, 16, and 17 were examined. Claim 1 is generic as to claims 1, 3-19, 27, and 28 so that upon allowance of claim 1, claims 3-7, 9, 11-15, 18, 19, 27, and 28 should be rejoined to the prosecution. As explained below, Applicant also requests that claims 20 and 22-26 be rejoined to the prosecution upon allowance of claim 1.

Allowable Claims

Claims 10, 16, and 17 were indicated to be allowable so that there is no further comment on those claims.

Relationship of Claims

In this Amendment examined claims 1 and 2 are combined as amended claim 1. Claims 20 and 21 are combined as amended claim 20.

Amended claim 1 is unarguably a generic independent claim with respect to all examined claims and describes a refrigerator. The refrigerator includes, among other elements, first and second compressors, a first radiator, first and second flow control valves, first and second evaporators, coolant cooling means, heat-exchange-amount control means, and a condenser. Amended claim 1 explains that the first coolant is carbon dioxide and that the first coolant and a second coolant are different materials.

Claim 9 depends from claim 1 and adds numerous elements relating to drying ratio, such as drying-ratio estimating means, drying-ratio control-range determination means, and a further control means that controls the flow volume of the second coolant so that the estimated drying ratio stays within an estimated control range.

Claim 9 makes reference to a coefficient of performance (COP). The coefficient of performance is extensively explained, particularly with respect to drying ratio, at pages 9-14 of the patent application. While this description appears under a heading for embodiment 1, the description is generic to the entire disclosure of the patent application and does not pertain to specific embodiments of the invention outside the scope of the elected species.

Drying ratio is defined most succinctly at page 12, lines 23-26. The drying ratio is the ratio of coolant in the vapor phase to the coolant in both vapor and liquid phases. As described in the cited portion of the patent application with respect to Figures 4 and 5, particularly, the invention, in some described embodiments, is directed to increasing the COP through control of the drying ratio at points within the claimed apparatus. Figure 5 demonstrates that improvements in COP can be closely related to control of the drying ratio, which relates to pressures and temperatures at various points within the circulating paths of the coolants. See, particularly, the discussion at page 13, lines 17-30 and at page 14, lines 17-24 of the specification.

Examined claim 8 depends from claim 1 and is somewhat similar to claim 9. However, claim 8 differs from claim 9 with respect to the recited control means. In claim 8, the control means controls the quantity of heat exchanged in the coolant cooling means, an element described in claim 1, in order to maintain the drying ratio that is estimated within a control range. In other words, the same result is produced by the control means of claim 8 as in claim 9, but the result is achieved in a different way.

The inventor further asserts that claim amended 1 is generic to amended claims 20 and 22-26. When the air conditioner as defined by amended claim 20 is being operated for cooling, the coolant cooling/heating means of amended claim 20 operates in the same way as the coolant cooling means of claim 1. Further, the heat-exchange-amount control means of claim 20 operates in the same way as the corresponding element of claim 1. These considerations demonstrate that claim 1 is generic to claims 20 and 22-26.

Prior Art Rejection and Response

Examined claims 1, 2, 8, and 9 were rejected as anticipated by Tamaoki et al. (U.S. Patent 6,529,133, hereinafter Tamaoki). This rejection is respectfully traversed as to amended claims 1, 8, and 9.

In making the rejection, emphasis was placed upon Figure 2 of Tamaoki. However, that figure must be considered in context of the brief specification of Tamaoki. The thrust of Tamaoki is to provide a remote monitoring system which gives notification of an abnormality in a refrigeration system and an indication of where in the system the abnormality may be.

Applicants agree that Figure 2 of Tamaoki discloses a two-stage refrigeration system. Each stage includes its own compressor. The two stages are linked through a cascade condenser 26 so that cooling provided by the expansion of the coolant in the first stage cools the coolant of the second stage, presumably providing lower temperature refrigeration than might be achieved with a single stage refrigeration system. The system shown in Figure 2 of Tamaoki also includes a temperature sensor 6 that is placed near the cascade condenser 26 to sense the temperature of that location where heat is transferred between the two stages of the refrigeration system.

Figure 1 of Tamaoki is a block diagram of the monitoring arrangement including monitoring the temperature sensed by the temperature sensor 6. The purpose of this temperature monitoring, as explained in column 5, lines 33-47 of Tamaoki, is to detect abnormalities that may occur and to give notice of the abnormalities. Further, the location of the abnormality is also identified in a message warning of the abnormality. Normal sensed values mean an abnormality is not likely in the parts of the system monitored by the corresponding sensors. Thus, if the temperature sensed by the sensor 6 is abnormal, "the user can recognize that abnormality occurs in the two-stage refrigeration system." Other abnormalities may suggest problems elsewhere and not in the two-stage refrigeration system.

It is important to recognize that Tamaoki provides a remote monitoring system that gives notice and warning of abnormalities in the refrigeration system so that action can be taken. Tamaoki is entirely silent concerning how the abnormalities are to be corrected. Most importantly, Tamaoki provides no response to the detection of an abnormality, other than the giving of notice of the detection. In other words, there is absolutely no control system in Tamaoki that responds to a detected abnormality by attempting to correct the abnormality. The only response is the sending of a warning.

None of amended claims 1, 8, and 9 can possibly be anticipated by Tamaoki. It is fundamental that for Tamaoki to anticipate any of those three claims, Tamaoki must disclose each element of the invention as claimed. The Examiner acknowledged that Tamaoki fails that stringent test but, at least with respect to one element of claims 8 and 9, defaulted to the doctrine of inherency. This reliance is totally misplaced.

None of the three claims can be anticipated by Tamaoki because Tamaoki does not describe anything that could correspond to the heat-exchange-amount control means as defined in generic amended claim 1. That control means controls the quantity of heat that is exchanged in the coolant cooling means, which presumably corresponds to the cascade condenser 26 of Figure 2 of Tamaoki. In examined claim 2, now amended claim 1, that coolant means includes the second compressor, the condenser, the second flow control valve, and the second evaporator. Thus, the heat-exchange-amount control means controls these elements as well as the first compressor, the first radiator, the first flow control valve, and the first evaporator.

All that Tamaoki provides in his apparatus with respect to such a control is the temperature sensor 6. There is no discussion in Tamaoki of any feedback arrangement or other kind of mechanism that could provide a control of any kind with respect to that single sensed parameter of the cascade condenser. The Office Action does not allege that an apparatus like the coolant control means and heat-exchange-amount control means of amended claim 1 is disclosed by Tamaoki. The reliance upon the doctrine of inherency seems to pertain only to limitations of claims 8 and 9, not amended claim 1. Therefore, because of this difference between the claims and

Tamaoki with respect to the coolant cooling means and the heat-exchange-amount control means, the rejection of claims 1, 8, and 9 is erroneous and should be withdrawn.

As previously mentioned, claims 8 and 9 expressly describe apparatus elements relating to drying ratio, estimating that drying ratio, determining a control range for the drying ratio, taking into account the coefficient of performance, and control means that responds to the estimated drying ratio in two different ways to ensure that control can be maintained. As to the rejection of this element of these claims, only two sentences were provided in the Office Action.

“The heat exchange control means inherently estimates the claimed drying ratio recited in claims 8 and 9. The recitation of the drying ratio control range determination means is inherently included in controller 11 [of Tamaoki].”

The foregoing recitation of the Office Action is factually erroneous and legally deficient. Element 11 in Tamaoki is not a controller but is a notebook computer that collects data transmitted on a LAN to a remote location where the refrigeration apparatus operation is being monitored. The function of that notebook computer 11 is simply the collection of and transmission of data. No control of any kind is described as being provided by that computer in Tamaoki to adjust any part of the refrigeration system. The assertion to the contrary in the Office Action is not supported by Tamaoki.

To rely upon inherency, an examiner must supply extrinsic evidence that makes clear that the descriptive matter of the reference, acknowledged to be missing is *necessarily* present in the thing described in the reference and would be so recognized by persons of ordinary skill. Inherency is not established by possibilities. MPEP 2112 IV.

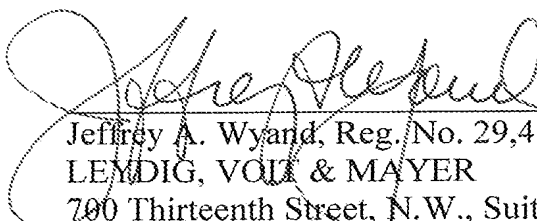
There is no reference of any kind in Tamaoki to measuring any quantity such as or related to drying ratio. The assertion that such an apparatus would be present in Tamaoki and would be used to estimate a drying ratio and to adjust a control range

that provides the ability to control quantity of heat exchange or flow rate of a coolant exceeds credulity. The rejection fails the basic legal test required to establish inherency and, on that basis, is legally erroneous.

Since, for the reasons provided here, there is no basis for concluding that any of amended claims 1, 8, and 9 could be anticipated by Tamaoki, upon reconsideration, the rejection of those claims should be withdrawn. Thereafter, claims 1, 8, 9, 10, 16, and 17 should be allowed and claims 3-7, 11-15, 18, 19, 27, and 28 should be rejoined to the prosecution and also allowed. Moreover, because claim 1 is generic to claims 20 and 22-26, those claims should likewise be allowed.

In this Response, no claim is amended. Therefore, any new rejection based upon newly cited prior art or a different legal ground cannot properly be a final rejection.

Respectfully submitted,



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